# Trainloading Country Elevator Cooperatives and Their Pricing Practices

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Pricing policies of trainloading country elevators dictate how benefits are returned to patrons and how the cooperative will fare in the marketplace. This report describes the historical development and current structure of the country elevator industry in selected north central states, applies economic theoretical constructs to the problem, updates a major cost study, and reports pricing policies employed by trainload shippers. Likely long-term impacts are then discussed.

## Historical Framework

Country elevators in the Upper Midwest were originally built along railroads about 7 to 14 miles apart to accommodate the distance a horse-drawn grain wagon could travel in a day. Country elevator numbers apparently peaked in the early 1920s. The advent of trucks and improved roads expanded the distance a producer could travel, significantly reduced delivery cost per bushel mile, and correspondingly increased the market area of grain elevators. Market areas of previously geographically isolated elevators now overlapped each other and created new competitive pressures. Relatively small differences in bid prices at distant elevators were sufficient incentives for farmers to bypass local country elevators. Expanded on-farm and off-farm storage built under incentives from government programs added to excess capacity as benefits from these programs fluctuated.

Unit-train rates for grain, initiated in 1967, and later rate deregulation prompted the most dramatic restructuring of the elevator industry. By shipping 25, 50, 75, or 100 cars from one origin to one destination, railroads realized substantial cost economies. These savings were passed, in part, to shippers. Many elevators rapidly expanded trackage, throughput, and often storage to capture these economies. In several areas unit-train loading capacity far outstripped demand for such services. During this same time railroads were abandoning many of their branch lines, leaving elevators on them without rail service.

Exploding export demand for grain and oilseeds during the 1970s mitigated the adjustment process. Then, with the deterioration of export demand, the country elevator industry was left with acute excess capacity. Some industry observers also point to a shift in production from high-yielding corn to lower-yielding soybeans as another element in reduced demand for throughput, but this has not happened since 1980.

Large trainloading facilities, thirsty for volume to cover fixed costs, have engaged in vigorous price competition. These radical changes have led to mergers and liquidations - a general restructuring of the industry that is still in progress. Continued depressed demand with accompanying excess capacity has created an environment with incentives for differential pricing.

## Theoretical Framework

Average cost pricing has been the dominant pricing policy of the country grain industry. Differential pricing has become more prominent in this mature industry with the advent of acute excess loadout capacity. Differential pricing is offering price premiums to different groups of patrons or patronage. Examples are harvest versus nonharvest, small versus large, near versus distant, or producer versus elevator patrons.

Different marginal costs and different demands are two theoretical justifications for differential prices. Marginal cost pricing is based on the different costs of providing services to different classes of patronage. It is in harmony with the cooperative principle of service at cost and also is legal. It is also relatively easy to rationalize to patrons, although it is often unpopular among them. The idea is to price the service so that equal margins exist for all patrons. If it costs 3¢ per bushel less to service one group of patrons, then that cost difference should be reflected in a price premium, thus maintaining the business-at-cost principle.

Differential prices based on different demands is more difficult to justify and explain to patrons. The legal basis hinges on the need to meet competitive pressures. That is, the cooperative, in order to compete for volume, must offer premiums to match premiums offered by competitors. But even this requirement need not concern cooperatives if they give differential patronage refunds so that the final price for service is at cost for each patronage group. Differences in demand arise when one group of patrons (e.g., market-area fringe versus nearby patrons or large versus small transactions) has more alternatives than another. The elevator would need to offer the fringe or large-volume patrons a premium over the nearby or small-volume patrons to attract their patronage from competing elevators. Economic incentive for both the cooperative's and the patrons' not receiving the premium is the resultant lower average cost to all patrons.

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## Economies of Size (Trainloading Facilities)

A 1982 economic-engineering study by Schnake and Stevens that generated synthetic economies-of-size costs for trainloading facilities was updated to illustrate standardized economies of size with different locations with different levels of utilization. This report was uniquely qualified because it localized costs for relevant states. It included costs for unit-train loading facilities and contained a detailed breakdown of capital investments and fixed and variable costs. Price indices were generated to update each cost component.

Costs were generated for 25-, 50-, 75-, and 100-car loadout facilities operating at 20, 35, and 50 trains per year in Iowa, Minnesota, Nebraska, and North Dakota. Elevators for each of these locations were site specific in that they represented typical crop combinations and cost structures for each state. Economies of size feasible in trainloading cooperative elevators in Iowa, Minnesota, Nebraska, and North Dakota are illustrated in Table 1. Average costs decline 8.80¢ per bushel (43 percent) and 3.37¢ per bushel (28 percent) as utilization increases from 20 trains per year in 15-train increments to 50 trains per year. These savings present powerful incentives to increase throughput in order to cover fixed costs and lower variable costs.

An intriguing observation was that average variable costs act much the same way to changes in volume as average fixed costs (i.e., until capacity constraints are reached). Average fixed costs declined 7.91¢ per bushel (60.0 percent) and variable costs declined 4.26¢ per bushel (56.7 percent) as utilization is increased from 20 to 50 cars per year (Table 1). The additional cost of handling an additional delivery approaches zero. Average total costs are therefore extremely sensitive to volume so long as excess capacity exists. This creates considerable incentive to increase volume because of the impact on average costs. Creative pricing and other policies to increase volume are to be expected.

**Table 1. Estimated Average Cost for a 50-Car Loadout Elevator, Three Levels of Utilization, Iowa, 1984.**

| Cost Component | Trains Per Year 20 | 35 | 50 |
|---|---|---|---|
| | (¢/bu) | | |
| Fixed | 13.18 | 7.53 | 5.27 |
| Variable | 7.51 | 4.36 | 3.25 |
| Total | 20.69 | 11.89 | 8.52 |

## Survey of 50 Selected Trainloading Cooperatives

Iowa and Nebraska were identified as states having some of the most acute problems with excess loadout capacity. North Dakota was included as a contrast because unit-train rates were introduced later and the industry did not appear to be seriously overbuilt. Cooperatives to be interviewed were selected from a complete list of trainload shippers in each state. They were selected on the basis of variety and number of patrons, satellite stations, and possible variety in pricing policies. Officers of the federated cooperatives and banks for cooperatives operating in these states nominated cooperatives for inclusion.

Cooperatives selected for the survey had relatively large trainloading throughput and storage capacity, a variety of patrons, and satellite receiving stations because they were selected on these criteria (Tables 2 to 4). One cooperative had six trainloading facilities with a total loadout capacity of 300 cars per day and 23.6 million bushels of storage. Separate cooperatives had 20 elevator patrons, nine single-car and 11 off-rail receiving stations. The smallest cooperative had .65 million bushels of storage and a 50-car-

**Table 2. Frequency Distribution of the Number of Independent Elevator Patrons and Receiving Stations Owned by 50 Selected Trainloading Cooperatives, 1985.**

| Frequency | Independent Elevator Patrons: Co-op | Nonco-op | Receiving Stations Owned: Train-loading | Rail[1] | Off-Rail |
|---|---|---|---|---|---|
| | (number of cooperatives) | | | | |
| 0 | 22 | 29 | 0 | 28 | 32 |
| 1 | 2 | 5 | 29 | 11 | 10 |
| 2 | 6 | 10 | 16 | 5 | 3 |
| 3 | 4 | 3 | 2 | 2 | 2 |
| 4 | 4 | 0 | 1 | 1 | 0 |
| 5 | 2 | 2 | 1 | 0 | 2 |
| 6-8 | 6 | 0 | 1 | 1 | 0 |
| 9-12 | 3 | 1 | 0 | 2 | 1 |
| . . . | | | | | |
| 20 | 1 | 0 | 0 | 0 | 0 |

[1]Nontrainloading rail shippers.

**Table 3. Storage Capacity of 50 Selected Trainloading Country Elevator Cooperatives, by State, 1985.**

| Storage Capacity | State: Iowa & Minnesota | Nebraska | North Dakota | Total |
|---|---|---|---|---|
| (--mm bu--) | (----------number----------) | | | |
| < 1 | 0 | 0 | 3 | 3 |
| 1 - 1.5 | 6 | 1 | 1 | 8 |
| 1.5 - 2.5 | 8 | 2 | 3 | 13 |
| 2.5 - 5.0 | 5 | 7 | 2 | 14 |
| 5.0 - 10.0 | 5 | 3 | 0 | 8 |
| > 10.0 | 3 | 1 | 0 | 4 |
| Total | 9 | 14 | 27 | 50 |

**Table 4. Average Distance to the Three Nearest Major Competitors, 50 Selected Cooperative Elevators, by State, 1985.**

| Closest Major Competitor | State: Iowa & Minnesota | Nebraska | North Dakota | Total |
|---|---|---|---|---|
| | (----------miles----------) | | | |
| First | 8 | 16 | 19 | 12 |
| Second | 15 | 27 | 36 | 22 |
| Third | 18 | 38 | 50 | 30 |

per-day loadout capacity. Several cooperatives had none of these types of patrons and/or satellite stations. The number of producer patrons averaged 1,208 and ranged from 250 to 4,061. Average storage and trainloading capacity and distance to nearest competition reflects, in part, density of production. North Dakota elevator storage capacity was smaller and was more distant from nearest competitors. North Dakota also had less excess loadout capacity. This rich variety in structural organization, facilities, and patrons together with acute excess capacity created an environment conducive to a variety of pricing policies.

Considerable variation in estimated gross margins by crops was reported (Table 5). Margins were generally lower in states where the respective crop was dominant.

Use of differential pricing among patrons and delivery stations varied considerably (Table 6). Only 10 (20 percent) of the 50 cooperatives sometimes used differential prices between producer patrons of different sizes. At the other extreme, 95 percent used differential pricing on grain received at rail versus off-rail stations.

This range in use of differential prices reflected both the magnitude of savings and difficulty of determining marginal cost. Double handling and additional trucking expense associated with deliveries to satellite (rail and off-rail) stations are relatively significant and unambiguous. Therefore, differential pricing was more widespread in these situations.

**Table 5. Estimated Gross Margins of 50 Selected Cooperative Elevators, by State, 1985.**

| Commodity/ Statistic | State: Iowa & Minnesota | Nebraska | North Dakota | Total |
|---|---|---|---|---|
| | (----------¢/bu----------) | | | |
| Corn: | | | | |
| Average | 7.8 | 9.9 | 10.4 | 8.7 |
| Range | 4-13 | 5-17 | 10-12 | 4-17 |
| Soybeans: | | | | |
| Average | 12.6 | 19.5 | 12.5 | 14.6 |
| Range | 8-25 | 8-25 | 8-20 | 8-25 |
| Wheat: | | | | |
| Average | 13.3 | 14.6 | 10.5 | 12.9 |
| Range | 12-15 | 9-22 | 7-15 | 7-22 |

Only institutional restrictions (premerger agreements) precluded even more elevators from using differential prices on grain received at satellite stations.

Estimates of economies of size associated with transactions and deliveries of different sizes were insignificant (Table 7). The weighted average estimate of reduced variable cost was 11.5 percent for selling expense for large over small transactions. Economies for large truck deliveries and transactions were next at 7 pecent and 6 percent, respectively. Even in these cases the absolute level of estimated savings was less than 0.2¢ per bushel and relative to the price of the commodity; it can only be measured in 1/100ths of a percent. Estimates of total savings from handling single transactions of 100,000 bushels amounted to only 0.6 of a cent per bushel or $600 for the entire transaction.

Managers were unable to support these estimates with cost data. It is apparent that they feel these cost differences are insignificant and/or such costs are difficult to determine. Perceptions apparently are what influence pricing policies. The practice of issuing diffrential patronage refunds to patrons receiving favorable prices surfaced infrequently. One elevator, for example, gave cooperative elevator patrons ⅓ the regular refund; some received none. This is equivalent to nonmember business.

## IMPLICATIONS

Eventual impacts of differential pricing as practiced by cooperative elevators will, of course, be a function of changes in competition, demand and resultant level of excess capacity, member attitudes, qualification of management, differences in cost structure, and premerger commitments. Justification for differential prices arise from an ability to separate patrons and differences in marginal cost and/or differences in demand. Difference in costs between different types of deliveries and transactions for grain-marketing first-handlers appear to be insignificant. Therefore, differential prices must be based on differences in demand.

**Table 6. Differential Pricing Between Categories of Patrons by Selected Grain Marketing Cooperatives in Iowa, Minnesota, Nebraska, & North Dakota, 1985.**

| Use | Large- vs. Small-Volume Producers | Large- vs. Small-Volume Transactions | To Top Off Unit Train | Rail vs. Off-Rail[1] | Single- vs. Multiple-Car Receiving Station[1] | Farmers vs. Elevator |
|---|---|---|---|---|---|---|
| | (percent) | | | | | |
| Never | 80 | 62 | 46 | 5 | 18 | 44 |
| Sometimes | 20 | 30 | 50 | 28 | 14 | 32 |
| Always | 0 | 0 | 4 | 67 | 68 | 24 |
| | (number) | | | | | |
| Cooperatives | 50 | 50 | 50 | 18 | 22 | 50 |

[1]Not all elevators had off-rail and single-car receiving stations.

**Table 7. Average Variable Grain Handling Costs and Savings Under Specified Conditions as Estimated by Managers of 50 Selected Cooperative Country Elevators, 1985.**

| Handling Item | Variable Cost | Savings of Large Over Small: Producer | Savings of Large Over Small: Truck | Savings of Large Over Small: Transaction[1] |
|---|---|---|---|---|
| | (¢/bu) | | | |
| Receiving | 3.3 | .05 (1.5) | .23 (7.0) | .20 (6.0) |
| Conditioning | 1.7 | .01 (0.5) | .02 (1.2) | .03 (1.7) |
| Selling | 1.3 | .02 (1.5) | .02 (1.5) | .15 (11.5) |
| Drying | 1.8 | .00 | .00 | .00 |

[1]Weighted average of estimated savings from a 100,000 bu transaction = 0.60¢/bu.

Elevator cooperatives pressured by competition to use differential prices face a dilemma with possible unpleasant consequences unless they also return differential patronage refunds in order to maintain the service-at-cost principle. Differential prices based on cost differences are easy to justify, explain, and understand. But prices based on differences in demand are not as easy to rationalize and appear to violate the business-at-cost principle. The only justification for giving large-volume deliveries and transactions a premium is the resultant impact on average costs. In this case small-volume patrons will be better off even though the business-at-cost principle has been compromised, because both average fixed and variable costs would be significantly lower. As explained above, the business-at-cost principle need not be compromised.

Boards can resolve the dilemma by

1. not giving premiums or using uniform prices;
2. giving minor premiums based on cost savings, thus preserving the business-at-cost principle and equal margins for patronage refunds; and
3. offering premiums larger than cost savings in order to attract volume and give differential patronage refunds or count such business as nonmember business.

Patrons receiving favorable prices and whose patronage is classified as nonmember business forfeit any right to patronage refunds. They have already received benefits in the form of favorable prices. But this practice would create a problem of equity generation. The problem could be circumvented if the cooperative generated equity with per unit capital retains, a common source of equity among dairy and fruit and vegetable cooperatives but rare among grain cooperatives.

## Farmers

The apparent impact of differential pricing will be another disadvantage faced by the small-volume patrons; their economic position is eroded. But this is a short-sighted and misguided view. The long-run position of a small-volume member will be enhanced by giving volume premiums. With differential prices the cooperative will operate with greater volume and lower costs. Small-volume members therefore receive a higher net price. With persistent use of uniform prices, the cooperative loses volume to competitors and average costs increase. Small-volume members receive lower net price as a result. A forced merger or liquidation of their cooperative may also take place.

In most competitive markets, policies of cooperatives will have limited net effect on farmers. Because of competition, changes will take place regardless of cooperative pricing policies. Nevertheless, if the more numerous small-volume members insist on uniform prices, they will drive large-volume members to elevators that will pay the premiums, and will thus leave their own elevator operating at a much lower capacity and higher costs. As a result, small-volume patrons will be in worse condition than before or in worse condition than if a premium had been offered to the large-volume patrons. Therefore, even small-volume patrons should support properly conceived premiums based on volume. The resultant higher volume would help cover fixed costs and thereby improve patronage refunds and prolong the useful life of the cooperatives.

## Satellite Stations

Satellite stations will, with few exceptions, decline in use and will in many cases be eliminated as receiving stations. Lower prices offered for delivery at these stations will help

move this structural change along. Differential pricing between main and satellite stations was the most common differential pricing reported.

In contrast to cost differences between farmers of different sizes, the cost savings of direct delivery to the main station is obvious and easy to measure. Grain is handled more than necessary. The elevator, rather than the patron, absorbs transportation costs. Not only is the grain handled an additional time, but variable costs are generally higher than at the main station because of less efficient equipment. Most fixed costs can be ignored because the physical plant has typically been depreciated out and alternative uses are minimal. It was the authors' impression that most differential prices did not fully reflect these additional costs.

## Cooperative Trainloading Elevators

Impacts of differential pricing policies on cooperatives are obscure and variable. The competitive environment, cost structure, and mind set of members and manager all play significant roles. Interaction of these variables will yield a variety of results.

Use of differential prices among different classes of patrons will place a cooperative on a firm competitive foundation - provided that prices are rationally based and its basic cost structure is relatively low. Such cooperatives will know how far to go to attract the necessary volume, when to let it go, and how to set margins so that one set of patrons is not subsidizing another set. These cooperatives will be competitive and be able to maintain volume, thus keeping costs at a minimum. However, the rationale and data supporting multiple prices will have to be clearly explained and understood. Otherwise, patrons, particularly those not receiving the premiums, may create adversary relationships. All patrons, particularly voting members, have a right to know that they are not being arbitrarily discriminated against.

## Single-Car Shipping Cooperatives

Cooperatives without trainloading facilities are not able to attract grain directly for export and for other high-volume shipments. Their high-volume patrons could be bid away by premiums paid by trainloading elevators thirsty for volume to reduce average costs. To share in the trainload rates, single-car shippers have to transship grain to elevators with trainloading facilities. Only 24 percent of the trainload shippers extended premium prices over what farmers received to these elevators; 32 percent did sometimes.

Favorable prics (lower margins) can be extended to single-car shippers because

1. delivery of relatively large shipments is timely,
2. receiving and handling costs are lower,
3. interest rates on inventory are lower, and
4. grain is sometimes blended and ready for shipment.

Blending could be a disadvantage because blending generally contributes to improved margins.

An amazing 44 percent of the trainload shippers did not offer their elevator patrons a premium over that of farmer members. It is difficult to conceive that such a policy can be maintained for long, particularly in the face of excess loadout capacity and the advantages of receiving grain from an elevator rather than producer patrons. To the extent that trainload shippers can persist in a uniform pricing policy, these elevator patrons will be under severe market and financial pressure. They cannot offer their patrons in the market area bordering the trainload shipper's market as favorable a price unless their merchandising operation is subsidized by another activity. These single-car shippers are, in effect, subsidizing farmer shippers to the trainloading facility. The incentive for single-car shippers to accept this business is the increased volume to cover their own fixed costs. They operate on the difference in price between the bids they can make on single-car rates and bids from the trainload shipper based on unit-train rates.

This is a rather gloomy picture for single-car shippers. But several will likely survive, at least in the short run, in better financial position than their overbuilt, high-fixed-cost, trainloading neighbors. These small elevators typically have fully depreciated facilities and low interest expense. They can also carve out for themselves special market segments where they have a comparative advantage. Several domestic markets, especially corn, sorghum, and wheat, cannot accommodate unit-train quantities. Single-car shippers are in just as good, if not better, position to service these needs. They also can pursue similar markets for lower-volume specialized crops.

## Federated Cooperatives

The impact of differential pricing by trainloading cooperatives on federated cooperatives is indirect. These policies will further weaken or draw business away from the federated system. Large-volume farmers would be attracted to trainload shippers and away from single-car shippers (traditional patrons of the federated cooperative), further weakening smaller cooperatives' traditional trade with the federated system.

Single-car shippers continue to need services provided by federated cooperatives, but the need will be for a slightly different mix of traffic and at reduced volumes. Federated cooperatives could take an aggressive role, and have done so, in helping to rationalize the location of satellite stations, size and location of trainloading facilities, etc., and change merchandising policies to accommodate the realities of new relationships created by unit-train rates.

## Noncooperative Trainloading Elevators

Noncooperative elevators were reported to have two major advantages over cooperatives. First, many noncooperative elevators seem to be concentrating exclusively on high-volume grain with low-cost facilities. Lower costs are derived from lower overhead from less elaborate facilities and equipment associated with greater storage capacity and services that cooperatives typically cover. Reduced switching from one grain to another lowers both handling and merchandising costs.

Second, they have greater freedom in pricing. Managers do not have to answer to a local board of directors composed of producers. They do not need to worry about openness generally present in a cooperative. Therefore, noncooperative elevators can engage in a wider variety of prices than cooperatives; patrons even expect it. Managers of cooperatives certainly thought it was taking place. To the

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presence each year in the crop production system may be anticipated. But plant diseases are constantly changing like the diseases of animals and man. It should not be surprising, then, to discover that two species of Septoria, previously either not found in North Dakota or found at noneconomic levels, should suddenly appear on our wheat crop under unusual environments.

Diseases on North Dakota crops have appeared and disappeared before. White rust and downy mildew attacked mustard in the Langdon area in the early 1960s and then became scarce. Septoria blotch has waxed and waned on North Dakota barley. While the immediate within-year losses to these diseases were serious, the problem was to determine if they were a continuing economic problem. This could only be answered by field, greenhouse and laboratory studies over time.

No control program was initiated for aster yellows on flax although it caused serious losses in the late 1950s and later ceased to be an economically important factor. However, growers who have had losses to diseases that came and disappeared after a few seasons are understandably demanding that the problem be solved. Solutions to such problems may not be quickly forthcoming, because practical and economic control are not always possible. If the problem is not a lasting one (e.g. aster yellows on flax), reduced budgets and higher priority problems will prevent resources from being assigned to this new problem. Even with good sources of major gene resistance, developing varieties with these additional resistance genes plus good agronomic characteristics takes several years and the fiscal resources that are currently being used on other problems. If the genes for resistance are polygenic, the development of resistant varieties will take longer and be more expensive.

The contest between man with his desired crop varieties and the world of pathogens is an ageless and continuing one that requires continued inputs of money and personnel. These economic inputs are required of public and private crop improvement programs. New technologies offer additional methods of achieving improved crop varieties, but they will not terminate the contest between man's crops and crop diseases.

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extent that cooperatives have a low-cost structure and are free to engage in differential pricing, they are in a relatively favorable position.

## Availability of Cost Data

One of the most disappointing and yet not surprising findings was the lack of cost data on which to base differential pricing decisions. Several elevators had detailed cost information but did not have it classified in a way that differential pricing policies could be defended. If accurate cost data is not available, differential prices may not include equal margins. Members have a right to know that one group of patrons is not subsidizing another.

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